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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/695,388

10/29/2003

Michinobu Tanioka

8008-1047

6821

466

7590

10/19/2004

YOUNG & THOMPSON
745 SOUTH 23RD STREET
2ND FLOOR
ARLINGTON, VA 22202

EXAMINER

TANG, MINH NHUT

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/695,388

Applicant(s)

TANIOKA ET AL.

Examiner

Minh N. Tang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 7 and 9-11 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 6, 8, 12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/29/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on October 29, 2003 is considered by the examiner.

Drawings

3. Applicants are required to explain why cooling jacket 22 is provided at different locations in Figs. 1 and 4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the

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examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference number "13" (Fig. 2) and reference number "16" (Fig. 3).

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "a sensor which detects heights of said probe needles of said probe card", "image processing means which performs image processing on said images picked up by said camera", "a control section which computes positions of said inspection target and said probe card based on image information acquired by said image processing means and controls said X stage, said Y stage and said rotary unit based on results of that computation"(claims 1

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and 10), "said camera as image processing means which picks up images of said inspection target and said probe needles of said probe card does not have an elevation unit and is fixed" (claim 7), and "detecting a point at which electric contact between said probe needles and said inspection target disappears" (claim 12) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The Preliminary Amendment (amended abstract) filed on October 29, 2003 has been entered.

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7. The disclosure is objected to because of the following informalities:

a/ on page 18, line 19, "For" should be -- for --.

b/ on page 19, line 4, "recognition It" should be -- recognition, it --.

c/ on page 22, lines 13 and 15, it is not clear what is meant by "OD".

Appropriate correction is required.

8. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: a sensor which detects heights of said probe needles of said probe card; a camera (i.e., only a single camera) which picks up images of said inspection target and said probe needles of said probe card; image processing means which performs image processing on said images picked up by said camera; a control section which computes positions of said inspection target and said probe card based on image information acquired by said image processing means and controls said X stage, said Y stage and said rotary unit based on results of that computation (claims 1 and 10); camera as image processing means which picks up images of said inspection target and said probe needles of said probe card does not have an elevation unit and is fixed (claim 7); said probe card has a base material whose thermal expansion coefficient is substantially equal to a thermal expansion coefficient of said inspection target (claim 8); and detecting a point at which electric contact between said probe needles and said inspection target disappears (claim 12).

9. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is

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requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

10. Claims 10 and 13 are objected to because of the following informalities:

a/ in claim 10, line 38, it is not clear what is meant by "that state".

b/ in claim 13, lines 1-2, there is insufficient antecedent basis for the limitation "said contact detecting step".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-2, 5, 7 and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujihara et al. (U.S.P. 5,410,259).

As to claims 1 and 10, Fujihara et al. disclose, in Figs. 6-9, a semiconductor device inspection apparatus (10) for acquiring electric contact between a semiconductor device and an inspection substrate, comprising: a wafer stage (41, Fig. 8) on which said semiconductor device (W, Figs. 6, 9) as an inspection target is to be placed; a base table (i.e., table next to support table 7, hereinafter base); an X stage (5a, Fig. 8) mounted on said base table (base) and movable in an X direction; a Y stage (5b, Fig. 8) mounted on said X stage (5a) and movable in a Y direction crossing said X direction; an

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elevation unit (42, Fig. 8) which is mounted on said Y stage (5b) and elevates said wafer stage (41) up and down; a rotary unit (49, Fig. 9) which turns said wafer stage (41); a vibration elimination table (see column 4, lines 26-31, hereinafter vibration-proof base) which reduces vibration of said base table (base); a probe card (9, Figs. 1, 9) having a plurality of probe needles (9a, Fig. 9) which electrically contact a plurality of electrodes (pads) when said wafer stage (41) moves upward; a probe card holder (1, Fig. 1) in which said probe card (9) is to be placed; a sensor (14, Fig. 8) which detects heights of said probe needles (9a) of said probe card (9); a camera (13, 14) which picks up images of said inspection target (W) and said probe needles (9a) of said probe card (9); image processing means (45, Fig. 9) which performs image processing on said images picked up by said camera (13, 14); and a control section (47, Fig. 9) which computes positions of said inspection target (W) and said probe card (9) based on image information acquired by said image processing means (45) and controls said X stage (5a), said Y stage (5b) and said rotary unit (49) based on results of that computation.

As to claims 2 and 11, Fujihara et al. disclose in Fig. 8, a linear scale (12) for detecting X-directional and Y-directional positions is arranged at center portions (i.e., when wafer chuck 4 is moved to the alignment bridge 11) of said X stage (5a) and said Y stage (5b), centers of said X stage (5a) and said Y stage (5b) are aligned with a center of an inspection probe (9a) and drive motors (46, Fig. 9) for said X stage (5a) and said Y stage (5b) and guide rails (see column 4, lines 38-41) for guiding said X

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stage (5a) and said Y stage (5b) in said X direction and Y direction are laid out symmetrically with respect to said center of said inspection probe (9a).

As to claim 5, Fujihara et al. disclose in column 3, lines 27-46, a camera (i.e., an optical system or an ITV camera or a microscope) mounted on a stable movable in X, Y and Z directions is placed on a top surface of said probe card holder so as to be able to observe a state of contact between said electrodes (pads) of said inspection target (W) and said probe needles (9a) of said probe card (9).

As to claim 7, Fujihara et al. disclose in Fig. 8-9, said camera (13, 14) as image processing means (45) which picks up images of said inspection target (W) and said probe needles (9a) of said probe card (9) does not have an elevation unit and is fixed.

As to claim 9, Fujihara et al. disclose in column 5, line 24 to column 6, line 57, in case where said electrodes (pads) of said inspection target (W) are electrodes fabricated in an ordinary semiconductor device fabrication process and further having metal projections formed thereon, images of said metal projections are picked up after picking up images at positions of said electrodes (pads) fabricated in said semiconductor device fabrication process, image pickup of said probe needles (9a) and said inspection target (W) is carried out at four locations (9b1-9b4).

Allowable Subject Matter

13. Claims 3-4, 6, 8 and 12-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The limitations recited in the claims 3-4, 6, 8 and 12-13 were not found in the art of record.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Obikane et al.	5,828,225	Semiconductor Wafer Probing Apparatus.
Karasawa	5,436,571	Probing Test Method Of Contacting A Plurality Of Probes Of A Probe Card With Pads On A Chip On A Semiconductor Wafer.
Sato et al.	4,929,893	Wafer Prober.
Sato	4,864,227	Wafer Prober.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh N. Tang whose telephone number is (571) 272-1971. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached on (571) 272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Minh N. Tang". The signature is fluid and cursive, with the first name "Minh" and last name "Tang" clearly distinguishable.

Minh N. Tang
Primary Examiner
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10/01/04